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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/813,930

03/31/2004

Chang-Hyun Kim

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EXAMINER

PYO, KEVIN K

ART UNIT

PAPER NUMBER

2878

DATE MAILED: 04/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/813,930

Applicant(s)

KIM ET AL.

Examiner

Kevin Pyo

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EW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-17 and 19-30 is/are rejected.
- 7) ☒ Claim(s) 9 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/31/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: On page 3, line 1, "107". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "diode" of claims 7 and 16; and the "plurality of sub-voltage stepping elements connected in series" of claims 8 and 17 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the

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drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:

On page 3, line 12, "fro" should be changed to --for--.

On page 4, line 33, the phrase "The AC signal inputted to the **collector terminal** of the second transistor 208 is transmitted to the **collector terminal** of the phototransistor 201" is confusing since the second transistor is a MOSFET type transistor. It appears the above phrase should be changed to -- The AC signal inputted to the gate terminal of the second transistor 208 is transmitted to the emitter terminal of the phototransistor 201--.

On page 5, line 15, "first" should be changed to --photo--.

On page 5, line 23, "first" should be changed to --photo--.

On page 10, line 21, "base" should be changed to --emitter--.

On page 11, line 19, "base" should be changed to --emitter--.

On page 13, line 24, "increased" should be changed to --decreased--.

On page 13, line 31, after "increased", -- -- should be inserted.

On page 14, line 6, " V_{bnode} " should be changed to -- V_{emt} --.

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On page 15, line 5, "emitter" should be changed to --base--.

On page 18, line 11, "increased" should be changed to --decreased--.

On page 18, line 18, after "increased", --. should be inserted.

On page 18, line 26, V_{bnode} should be changed to -- V_{emt} --.

On page 19, line 17, "308" should be changed to --508--.

On page 19, line 25, "emitter" should be changed to --base--.

On page 20, line 31, "baser" should be changed to --base--.

Appropriate correction is required.

Claim Objections

4. Claims 22 and 27 are objected to because of the following informalities:

In claim 22, line 4, "base" should be changed to --emitter--.

In claim 27, line 4, "base" should be changed to --emitter--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-5, 10-14 and 20-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Shinohara et al (6,300,615).

Regarding claims 1, 20 and 21, Shinohara et al shows in Figs.7, 8 and 14 the following elements of applicant's claim: a) a photoelement (51) having an emitter terminal and a base terminal to generate a current according to an incident light signal; b) a charging capacitor (10 in Fig.14) to discharge current charge therein when the light signal is inputted to the photoelement; c) a voltage control circuit (MP1, MP2 in Fig.7) connected to the emitter terminal of the photoelement to maintain a voltage of the emitter terminal of the photoelement constant (the voltages of the base terminal and the emitter terminal of Q1 are maintained constant in view of feedback configuration of MP1 and MP2); and d) at least one voltage stepping element (121 in Fig.8; col.7, lines 30-31) connected to the voltage control circuit to step the voltage of the emitter of the photo element by a predetermined segment.

Regarding claims 2 and 11, the limitations therein are disclosed in col.5, lines 49-51.

Regarding claims 3, 12 and 22, the voltage of the emitter terminal of Q1 is linearly related to the voltage of the base terminal of Q1 (the voltage of the emitter (V_e) is lower than that of the base (V_b) by the threshold voltage of Q1 (V_{be} , i.e. 0.7V), and the relationship of V_e and V_b can be expressed by the equation $V_b = V_e + 0.7$).

Regarding claims 4, 13 and 23, Shinohara discloses a reset unit (11) to reset the capacitor (10).

Regarding claims 5 and 14, Shinohara shows in Fig.7 a constant current source (53).

Regarding claims 10 and 24, Shinohara et al shows in Figs.7, 8 and 14 the following elements of applicant's claim: a) a photoelement (51) having an emitter terminal and a base terminal to generate a current according to an incident light signal; b) a charging capacitor (10 in Fig.14) to discharge current charge therein when the light signal is inputted to the photoelement;

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c) a voltage control circuit (MP1, MP2 in Fig.7) connected to the emitter terminal of the photoelement to maintain a voltage of the emitter terminal of the photoelement constant (the voltages of the base terminal and the emitter terminal of Q1 are maintained constant in view of feedback configuration of MP1 and MP2); d) at least one voltage stepping element (121 in Fig.8; col.7, lines 30-31) connected to the voltage control circuit to step the voltage of the emitter of the photo element by a predetermined segment; and e) a shutter (20 in Fig.4; col.4, lines 39-40) to control a discharging characteristic of the charging capacitor according to strength of light incident on the photoelement.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 6-8, 15-17, 19 and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinohara et al (6,300,615).

Regarding claims 6-8 and 15-17, although Shinohara et al does not specifically mention the recited voltage stepping elements, depending on the desired performance and design requirements, the specific type of a voltage stepping element utilized would have been an obvious design choice within the skill of a person of ordinary skill in the art depending on the needs of the particular application.

Regarding claims 19, 25, 26 and 29, Shinohara et al has been discussed above. Shinohara et al differs from the claimed invention in that it does not specifically mention a discharging time of the capacitor is controlled according strength of the light signal. However, the specific scheme utilized to discharge the capacitor would have been obvious to one of ordinary skill in the art at the time of the invention was made in view of the desired performance.

Regarding claim 27, the voltage of the emitter terminal of Q1 is linearly related to the voltage of the base terminal of Q1 (the voltage of the emitter (V_e) is lower than that of the base (V_b) by the threshold voltage of Q1 (V_{be} , i.e. 0.7V), and the relationship of V_e and V_b can be expressed by the equation $V_b = V_e + 0.7$).

Regarding claim 28, Shinohara discloses a reset unit (11) to reset the capacitor (10).

Regarding claim 30, the limitation therein is disclosed in col.4, lines 39-40.

Allowable Subject Matter

9. Claims 9 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

The prior art fails to disclose or make obvious a photocell comprising, in addition to the other recited features of the claim, the specific interconnections between a first MOS transistor, a second MOS transistor and a photoelement. More particularly, the prior art (i.e. Shinohara et al) shows in Fig.7 the gate of the first MOS transistor (MP1) is connected to the base of the phototransistor (Q1), and does not disclose or suggest the claimed interconnections (i.e. a gate

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terminal of the first MOS transistor is connected to a source terminal of the second MOS transistor and an emitter terminal of the photoelement).

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Pyo whose telephone number is (571) 272-2445. The examiner can normally be reached on Mon-Fri (with flexible hour), First Mon. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kevin Pyo
Primary Examiner
Art Unit 2878

Pkk
4/6/07